



Hoof Rot and Hoof Scald in Sheep and Goats

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It is common during wet, rainy conditions to see goats or sheep limping within a flock. Two of the more common causes of these ailments are hoof scald and hoof rot. Both are diseases of the hoof that producers battle in wet, humid climates that cost time and money.

Hoof Scald

Hoof scald, or benign hoof rot, refers to inflammation between the toes of the hoof caused by the bacterium *Fusobacterium necrophorum*. *F. necrophorum* is commonly found in ruminant feces and is always present on grazed pastures, especially in areas where animals frequently congregate. Hoof scald affects both goats and sheep and occurs most often during persistently rainy weather or heavy dew, allowing *F. necrophorum* to live in the soil for up to 18 weeks. When livestock spend a prolonged amount of time in muddy areas and/or areas with a lot of manure, such as around watering troughs, the space between the hooves becomes irritated, allowing the bacterium to readily invade and infect the area. The signs an animal may show if it has hoof scald are:

- Limping
- Non-weight bearing
- Weight loss
- Decreased body condition
- Grazing on knees
- Reluctance to move
- Decreased milk production
- Decreased wool production
- Raw between the toes
- Moist between the toes

If an animal is presenting signs, the animal needs to be examined.



Figure 1. Hoof Scald. Red irritated skin between toes.

After examination, one must determine if the problem is hoof scald, hoof rot or another ailment. If the problem is hoof scald, then the skin between the toes will be red, inflamed and often moist and raw. If these signs are present along with a foul odor, pus and/or damage to the hoof itself, then the animal has a condition known as hoof rot.

Hoof Rot

Hoof rot, or virulent hoof rot, occurs when hoof scald is left untreated. To progress into virulent hoof rot, a second bacterium, *Dichelobacter nodosus*, enters the tissues between the toes where *F. necrophorum* has already caused inflammation. Hoof rot is a disease that first affects the skin between the toes and then spreads to the hooves. It is believed that once *F. necrophorum* infects the tissues between the toes it creates the necessary environment for *D. nodosus* to enter and infect the tissues and the hoof itself. Hoof rot presents with the same signs as listed for hoof scald plus hoof wall separation, pus and a very distinct foul odor. If left untreated,

animals often go off feed and may become severely lame. In severe cases, the animal may need to be humanely euthanized.

Hoof rot can recur under certain environmental conditions. The ideal ground conditions for hoof rot are high moisture and a temperature range of 50 degrees fahrenheit to 70 degrees fahrenheit. The wet, humid climate in the southern United States provides favorable conditions for the disease. *D. nodosus* can live in the soil for up to 14 days and in the hoof for up to 6 weeks under the correct anaerobic conditions.



Figure 2. Severe Hoof Rot. Photo courtesy of Scotland's Farm Advisory Service.

Prevention

- 1. Pasture Hygiene:** When several animals in a herd present with hoof rot more than once, pasture hygiene might be a main factor. Drainage improvements are necessary if the ground stays moderately wet to muddy on a regular basis. Other amendments like laying gravel or straw around watering areas may be needed to control muddy conditions in areas where animals commonly congregate. Programs like the U.S. Department of Agriculture Environmental Quality Incentives Program and the Food Animal Concerns Trust provide funding for producers to make pasture improvements.
- 2. Hoof Trimming:** For prevention purposes, hoof trimming should take place on an average of twice a year as part of herd management. Some herds may need to be trimmed more frequently, while others may not need trimming at all. Trimming frequency depends on animal genetics, soil and pasture conditions. Remember to disinfect the trimming instruments between animals to prevent the spread of any infection. Another option is to lay down gravel in heavy use areas and/or place concrete items such as cinder

blocks or concrete culverts for the animals to climb. The friction caused by movement over these coarse materials will help decrease the frequency of hoof trimming.

- 3. Hoof bath:** Ten percent zinc sulfate or copper sulfate baths can be used routinely after hoof trimming as a preventative measure. Hoof baths should also be used on any animal after returning from shows and on new stock upon arrival before going into the recommended 30-day quarantine. Copper can be toxic to sheep, so special care must be taken to prevent ingestion of the copper by the animals. For this reason, zinc sulfate baths are typically used with sheep.

Treatment

If the animal has hoof scald, make sure the hoof is properly trimmed and spray a 10 percent zinc sulfate or copper sulfate solution between the affected toes. Keep the animal in a dry, clean environment and treat one to two times a day until healed. If the animal is on pasture, make sure it is separate from the rest of the herd and wait until the dew has dried before treating.

Treating hoof rot is much more costly and time-consuming than treating hoof scald. Infected animals should be separated from the herd to prevent the spread of infection. The best approach to treating those infected is a combination of the four methods listed below.

- 1. Hoof Trimming:** Trimming the hooves for hoof rot treatment removes infected hoof material, reduces the number of bacteria that can hide in excess hoof material and exposes bacteria to air and medications.

Hoof trimming often involves removing a large portion of the hoof wall as well as any over growth. The removal of the hoof material is important for allowing medication and oxygen to reach the bacteria and kill them.

- 2. Hoof Baths:** There are two solutions commonly used: zinc sulfate and copper sulfate. The same solutions used for prevention can be used for treatment but must be used for a longer duration and more often. As a treatment for hoof rot, hoof baths should be used one to two times a week until the hooves are healed.
 - Zinc sulfate (10 percent solution = 8 pounds in 10 gallons of water) is the most effective and least toxic. Wool or cotton should be added to the solution to reduce splashing and discourage drinking. One-third cup of liquid detergent, used as a wetting agent, may also be added to increase

penetration into the cracks and crevices of the hoof. The use of zinc sulfate as a hoof soak (30-60 minutes of contact) increases the efficacy in a treatment program. Sufficient sized baths/soaks are necessary to handle the herd and allow sufficient contact time with the solution.

- Copper sulfate solution (10 percent solution = 8 pounds in 10 gallons of water) is also useful when used properly. Hot water and/or vinegar helps to dissolve copper sulfate. Like zinc sulfate baths, wool or cotton should be added to reduce splashing, and adding one-third cup of liquid detergent as a wetting agent can help with hoof penetration. Be aware that copper sulfate is very corrosive and will stain wool or cotton. Also, remember copper can be toxic to sheep in high levels. Watch them closely while they are in the hoof bath to prevent drinking.

3. Antibiotics: When using antibiotics, it is always best to follow the recommendations of a veterinarian. Most medications used to treat sheep and goats are considered extra-label and legally require veterinary supervision. Be aware that any medication used in food for animals has a required withdrawal period prior to slaughter to prevent drug residues in the meat. There are also separate withdrawal periods to avoid residues in milk.

4. Culling: Animals that present with hoof rot more than once should be culled to avoid losses associated with treatment and decreased production. These animals are likely genetically predisposed to be susceptible to disease. Some animals may have a defect in their hoof structure or may have problems with their immune system. Either way, they will not add value to your flock.

Eradication of hoof rot is possible, but it takes years, is very difficult and requires a strict commitment. Before a flock or pasture can be considered hoof rot-free, a minimum of two years must pass without a single case occurring. All of the previously described preventative measures must be used consistently, and the animals must be monitored constantly to remain free from hoof rot.

Hoof scald and hoof rot are common in Arkansas due to the wet, humid conditions that come with being part of a sub-tropical zone. Pasture hygiene is key to preventing these diseases, and hoof trimming combined with medicated hoof baths are key to treating them. If you can prevent hoof scald first, you can stop the progression into hoof rot and avoid the problems discussed. You will save time and money by taking a proactive approach with eradication being your ultimate goal.

References

Bulgin, Marie S. Merck Veterinary Manual. Contagious footrot in sheep. www.merckvetmanual.com, September 2018

Vipond, John. How much does footrot cost? Scotland's Farm Advisory Service. 2017. <https://www.fas.scot/article/much-footrot-cost/> (Accessed: Dec. 17, 2018)

Veterinary Medicine: A textbook of the diseases of cattle horses, sheep, pigs, and goats. Contagious Footrot in Sheep. Saunders. 2014. Pp 1070-1072

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